Low Mass Low Power Hall Thruster System, Phase II

Completed Technology Project (2011 - 2013)

Project Introduction

In NASA is seeking an electric propulsion system capable of producing 20mN thrust with input power up to 1000W and specific impulse ranging from 1600-3500 seconds. The key technical challenge of the topic is the target mass of 1kg for the thruster and 2kg for the power processor (PPU). In Phase 1 Busek develop an overall subsystem design for the thruster/cathode, PPU and XFS. The feasibility of a low mass power processing architecture that replaces four of the DC-DC converters of a typical PPU with a single multi-functional converter and a low mass Hall thruster design employing permanent magnets was demonstrated. In Phase 2 effort will develop an engineering prototype model of the low mass BHT-600 Hall thruster system with the primary focus on the low mass PPU and thruster. The broad technical objectives are: 1) Design, fabricate and demonstrate an engineering model version of the low mass, Hall thruster PPU developed in Phase 1. The target mass is 2kg. 2) Design, fabricate and demonstrate a low mass version of the BHT-600 thruster The target mass and efficiency is 1 kg and >45%, respectively. 3) Conduct an integrated system test and deliver the prototype PPP and thruster system to NASA.

Primary U.S. Work Locations and Key Partners

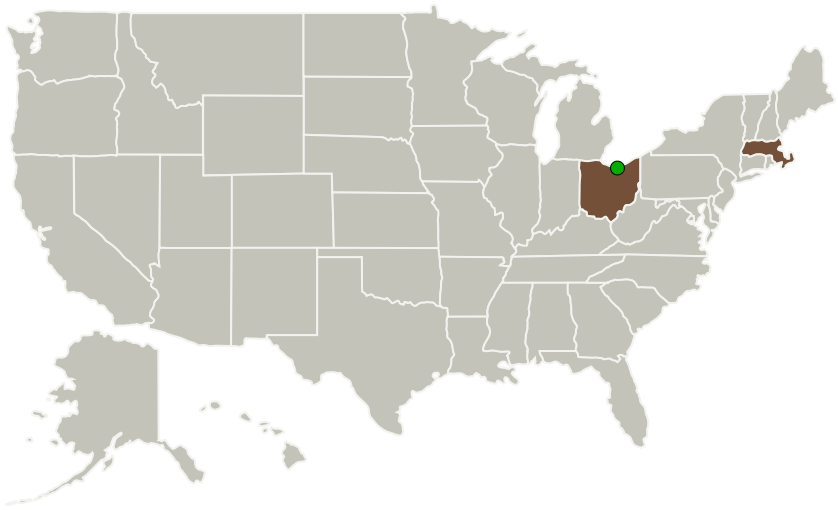

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Table of Contents

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Organizations Performing Work	Role	Type	Location
Busek Company, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Natick, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

June 2011: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139050)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Busek Company, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bruce Pote

Co-Investigator:

Bruce Pote

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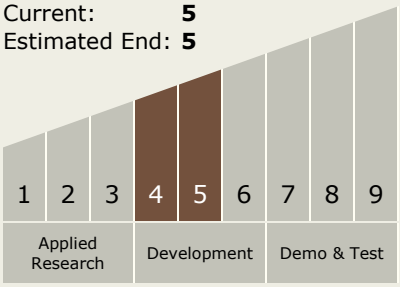
Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.2 Electric Space Propulsion
    - TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System